

## HIGH-SWING TRANSCONDUCTANCE AMPLIFIER FOR CHARGE PUMP CIRCUIT

### ABSTRACT OF THE DISCLOSURE

A charge pump circuit includes a high-swing transconductance amplifier. A high input swing transconductance is provided in a negative feedback loop of the charge pump circuit without an abrupt change in transconductance. The high-swing transconductance amplifier includes a transconductance cell and high-swing circuitry. The transconductance cell includes a current supply transistor, which provides current for transconductance while input voltages are within the operational range for the transconductance cell. When the input voltages increase so as to be outside of the operational range, the current source transistor enters into triode region of operation, and provides reduced current. The high-swing circuitry supplies the current in this case so that abrupt change in transconductance does not occur. The high-swing circuitry widens the output compliant voltage range of the charge pump circuit and hence reduces the sensitivity requirement of the VCO,  $K_{vco}$ , in any PLL design, in particular design for PLLs used in tuners.

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